IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Confirmation No: 2397

In re Application of:

Jeff EDER

Serial No.: 09/688,983

Filed: October 17, 2000

For: Automated risk transfer system

Group Art Unit: 3693

Examiner: H. Dass

Supplemental Reply Brief

Commissioner of Patents and Trademarks
Washington, D.C. 20321

Sir or Madam:

A reply brief is required at least in part because the Examiner did not provide an explanation as to how the documents that are the basis for the obviousness claim rejections were going to be combined until the 23 July 2007 Examiner's Answer.

Related appeals

An Appeal for U.S. Patent Application 09/761,670 filed on January 18, 2001 may be affected by or have a bearing on this appeal. An appeal for U.S. Patent Application 10/329,172 filed December 24, 2003 may be affected or have a bearing on this appeal. An appeal for U.S. Patent Application 10/746,673 filed December 24, 2003 may be affected or have a bearing on this appeal.

Status of Claims

Claims 157 - 181 and claims 201 - 213 are the subject of this appeal. No other claims are pending. Claims 1 - 156 have previously been cancelled without prejudice and claims 182 – 200 were previously withdrawn because of a restriction requirement.

Grounds of rejection to be reviewed on appeal

Issue 1 - Whether claims 157, 159, 160, 161, 162, 163, 165, 166, 167, 169, 171, 172, 173, 174, 175, 176, 178, 179 and 180 are patentable under 35 USC 103 over the Baseman method for integrated supply chain and financial management (U.S. Patent 6,671,673) and Tamayo (U.S. Patent 6,836,773)?

Issue 2 - Whether claims 158, 164, 170 and 177 are patentable under 35 USC 103 over Baseman (U.S. Patent 6,671,673) and Tamayo (U.S. Patent 6,836,773) in view of Packwood (U.S. Patent 7,006,992)?

Issue 3 - Whether claims 168, 181, 203, 206 and 208 are patentable under 35 USC 103 over Baseman (U.S. Patent 6,671,673) and Tamayo (U.S. Patent 6,836,773) in view of Ranger (U.S. Patent 7,006,992)?

Issue 4 - Whether claims 201, 202, 204, 207, 209 and 211 are patentable under 35 USC 103 over Baseman (U.S. Patent 6,671,673) and Tamayo (U.S. Patent 6,836,773) in view of Ching (U.S. Patent 6,078,901) and claims 205 and 210 are patentable under 35 USC 103 in view of Baseman, Tamayo, Ching and Packwood?

Issue 5 - Whether claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167, claim 168, claim 169, claim 170, claim 171, claim 172, claim

173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 are enabled under 35 USC 112, first paragraph?

Issue 6 – Whether claim 201, claim 202, claim 203, claim 204, claim 205, claim 206, claim 207, claim 208, claim 209, claim 210, claim 211, claim 212 and/or claim 213 are enabled under 35 USC 112, first paragraph?

Issue 7 - Whether the invention described in claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167 and/or claim 168 represents patentable subject matter under 35 USC 101?

Issue 8 - Whether the invention described in claim 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 represents patentable subject matter under 35 USC 101?

Issue 9 - Whether the invention described in claim 201, claim 202, claim 203, claim 204, claim 205 and/or claim 206 represents patentable subject matter under 35 USC 101?

Issue 10 - Whether the invention described in claim 207, claim 208, claim 209, claim 210, claim 211, claim 212 and/or claim 213 represents patentable subject matter under 35 USC 101?

Issue 11 – Whether pending claim 211 is unpatentable under the statutory double patenting prohibition given pending claim 204?

Issue 12 – Other informality considerations

The Argument

For each ground of rejection which the Appellant contests herein which applies to more than one claim, such additional claims, to the extent separately identified and argued below, do not stand and fall together.

Issue 1 - Whether claims 157, 159, 160, 161, 162, 163, 165, 166, 167, 169, 171, 172, 173, 174, 175, 176, 178, 179 and 180 are patentable under 35 USC 103 over the Baseman method for integrated supply chain and financial management (U.S. Patent 6,671,673) and Tamayo (U.S. Patent 6,836,773)?

The claims are patentable because the cited combination of Baseman and Tamayo used to support the rejection of claims 157, 159, 160, 161, 162, 163, 165, 166, 167, 169, 171, 172, 173, 174, 175, 176, 178, 179 and 180 fails to establish a prima facie case of obviousness for a number of reasons. Specific reasons the cited combination fails to establish a prima facie case of obviousness include:

1. the cited combination of document teachings requires a change in the principles governing the operation of the Baseman and Tamayo inventions;

2. the cited combination of documents fails to make the invention as a whole obvious by teaching away from the claimed methods;

3. the cited combination of document teachings would destroy the ability of the Tamayo invention to complete its primary function of providing near-real-time predictions regarding web site visitors; and

4. the cited combination of documents fails to teach one or more limitation for every claim.

Reason #1 - The first reason the cited combination of documents fails to establish a prima facie case of obviousness that would support the rejection of claims 157, 159, 160, 161, 162, 163, 165, 166, 167, 169, 171, 172, 173, 174, 175, 176, 178, 179 and 180 is that the proposed combination of document teachings would change the principle of operation of the Tamayo and Baseman inventions. *MPEP 2143.01 provides that when "the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)".*

The Baseman invention is <u>a method to generate a plan for supply chain management</u> that improves financial performance. In particular, the method extends supply chain management using financial management considerations, extends financial management using supply chain

management considerations, employs supply chain management techniques to improve financial management, and employs financial management techniques to improve supply chain management. (page 53, Evidence Appendix, Baseman, Abstract). The Tamayo invention enables near-real-time predictions about the likely behavior of a current visitor on a web site. One of the principles of operation that supports this capability is limiting the storage of data to data that are relevant to web site visitor behavior. The Tamayo invention has similarities to personalization systems that have been available for some time (see Quinn for example). As described below, a change in the principle of operation of both the Baseman invention and the Tamayo invention is required to complete the modifications proposed by the Examiner.

1. Change Baseman from supply chain plan development to operations management. Consistent with the supply chain plan development principle of operation, the Baseman invention teaches a process that:

   1. *Reviews all possible combinations.* At the heart of the Baseman process is the review of each possible combination of supply chain management functions (i.e. inventory management) and financial analysis techniques (i.e. opportunity cost). This review is completed in order to determine if the combination will improve the performance of the supply chain (see pages 36 - 37, Reply Brief Appendix);

   2. *Relies on subjective analysis.* The review of each combination completed in 1 relies on a subjective determination of the likely impact of the different combinations identified in step 1 (see pages 36 - 37, Reply Brief Appendix);

   3. *Is used primarily for long term decision making.* Baseman provides eighteen examples of applying the claimed method for combining "supply chain thinking" with financial analysis while developing a plan. Fifteen of the eighteen examples involve making decisions about which countries, customers and/or vendors it makes sense to do business with and/or in over the long haul. The other three examples involve adding financial considerations to an existing activity.

In the 23 July, 2007 Examiner's answer for the instant application, the Examiner has proposed modifying the supply chain plan development principle of operation of Baseman by combining the data management of Tamayo with the Baseman supply chain plan process to render obvious an invention for optimizing risk management activities for a commercial enterprise. The proposed combination would change the Baseman process as shown below:

Baseman invention as claimed	Proposed Baseman Modification
Review possible combinations	Respond to current risks
Subjective analysis	Decisions based on measurements
Long-term decision making	Activity development and optimization
Focused on the supply chain	Focused on the entire enterprise
Produce a supply chain/finance plan	Manage day to day operations

Because the change proposed by the Examiner would change the key features, focus and output of the Baseman process it would change the principle of operation of the Baseman invention.

Because the proposed modification changes the supply chain plan development principle of operation in the Baseman invention, the teachings of the documents are not sufficient to render the claims prima facie obvious.

2. Change Tamayo from the integration of data relevant to web site visitors to the integration of all supply chain data. The Tamayo invention ironically uses the word "personalization" to describe its process of using association rules and related techniques to identify other people that are somehow similar to a current visitor and making predictions about the current visitor on the basis of what the other, "similar" people did or did not do in the past. More specifically, "the personalization application collects the data and uses it to build predictive models that support predictions in the form: "a person who has clicked links x and y and who has demographic characteristics a and b is likely to buy z" (see page 33, Reply Brief Appendix, Tamayo, C10, L25 – L30). The different predictive models are used to identify the data that are relevant to making a prediction. For example, the predictive model described in the preceding sentence would be used to identify the fact that clicking on links x and y and having characteristics a and b are relevant features that require data.

As described in the Tamayo specification, the integration of only the data that are relevant to predicting web site visitor behavior is the key to being able to process data at the required speeds. The Tamayo invention is faced with sorting through millions of possible combinations of clicks and characteristics. To cut the problem down to a more manageable size an assumption is made that some data can be ignored and that only data germane to "relevant features" should be integrated (note: the process for identifying relevant features

is not fully explained). Tamayo states: "the selection of particular relevant features <u>is very</u> <u>important</u> to reduce the dimensionality of the datasets used in the data mining processing" (page 35, Reply Brief Appendix, Tamayo C16, L5 – L9).

In the 23 July, 2007 Examiner's answer for the instant application, the Examiner has proposed combining the Tamayo data management system with the teachings of Baseman to render obvious an invention for optimizing risk management activities for a commercial enterprise. However, integrating all the data required to support the supply chain analysis taught by Baseman would change a principle of operation in the Tamayo invention and increase data storage by an order of magnitude.

Tamayo process as claimed	Proposed Modification
only data relevant to web site visitor behavior prediction are integrated	all supply chain data are integrated

Because the proposed modification changes the <u>integration of only data relevant to web</u> <u>site visitor behavior</u> principle of operation in the Tamayo invention, the teachings of the documents are not sufficient to render the claims prima facie obvious

<u>Reason #2</u> - The second reason the cited combination of documents fails to establish a prima facie case of obviousness that would support the rejection of claims 157, 159, 160, 161, 162, 163, 165, 166, 167, 169, 171, 172, 173, 174, 175, 176, 178, 179 and 180 is that the cited combination of documents fails to make the invention as a whole obvious by teaching away from the claimed methods. *MPEP §2141.02 states that: "in determining the difference between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious but whether the claimed invention as a whole would have been obvious."* Furthermore, it is well established that: *A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).* The ways in which the cited documents (Baseman and/or Tamayo) lead away from the claimed invention include:

1) claims 157 and 169 (affects claims 158 - 167 and claims 170 -181), the cited documents teach away from:
   determining a combination of risk management activities that optimize aspects of enterprise financial performance selected from the group consisting of market value, risk and combinations thereof within a constraint of the available capital

Baseman teaches away from the optimization of market value, risk and the combined optimization of market value and risk:

    1) by teaching that the primary benefit of reducing risk is reducing the cost of capital/discount rate for the corporation as this precludes both the separate and the combined optimization of risk and value (page 54, Evidence Appendix C6, L22 – L32),

    2) by teaching the use of the VaR metric which does not support risk optimization (see page 38, Reply Brief Appendix, C3, L16 – 17, and page 65, Evidence Appendix), and

    3) by teaching that the only element of value that needs to be modified is the supply chain (see page 36, Reply Brief Appendix, pages 53 – 57 Evidence Appendix).

2) claims 159 and 171, the cited documents teach away from:

> *wherein a market value further comprises one or more categories of value selected from the group consisting of an current operation, real option, market sentiment and combinations thereof*

Baseman teaches away by mentioning <u>but not using</u> real option analysis as one of the many techniques for financial analysis and by teaching value instead of market value;

3) claims 160 and 172, the cited documents teach away from:

> *wherein a risk management activity is selected from the group consisting of establishing one or more risk management control systems, completing one or more risk transfer transactions and combinations thereof*

Baseman teaches away from risk control systems and risk transfer transactions by teaching a process for long term decision making that is designed to minimize or eliminate the need for risk control systems and risk transfer transactions by maximizing the benefits of natural hedging (see page 55, Evidence Appendix, C8, L9), Baseman also teaches away by teaching the addition of risk analysis to existing systems (i.e. scheduling) instead of developing a separate program for risk control;

4) claims 162 and 174, the cited documents teach away from:

> *wherein completing one or more risk transfer transactions further comprises completing activities selected from the group consisting of insurance purchases, derivate transactions, and combinations thereof*

Baseman teaches away from risk transfer transactions by teaching a process for long term decision making that is designed to minimize or eliminate the need for risk transfer transactions by maximizing the benefits of natural hedging (see page 55, Evidence Appendix, C8, L9). The primary risk analysis technique (i.e. VaR) taught by Baseman also teaches away by failing to provide the level of detail required to support these transactions;

5) claims 163 and 175, the cited documents teach away from:

> *developing a computational model of organization market value by category of value, element of value and external factor by completing a series of multivariate analyses in an automated fashion using at least a portion of the data, and*

quantifying a plurality of risks by a category of value using said model, where a category of value is selected from the group consisting of current operation, real option, market sentiment and combinations thereof.

Baseman teaches away from the quantification of risk by category of value by teaching the use of the VaR metric which only produces one number for the limited number of risks analyzed (see page 38, Reply Brief Appendix, C3, L16 – 17), by failing to teach all the steps required to support simulation and by teaching that the primary benefit of reducing risk is reducing the cost of capital/discount rate for the corporation (which eliminates separate value and risk analysis and optimization).

6) claims 165 and 178, the cited documents teach away from:

supporting an optimization of aspects of financial performance selected from the group consisting of current operation value, real option value, market sentiment value and combinations thereof.

As discussed previously, Baseman teaches away from real options and market value; and

7) claims 166 and 179, the cited documents teach away from:

where determining an optimal combination of risk management activities further comprises using … multi-criteria optimization.

Baseman teaches away from the use of multi-criteria optimization by teaching that the primary benefit of reducing risk is reducing the discount rate for the corporation – this eliminates the use of separate calculation and optimization of risk and value.

Taken together the cited combination of documents fails to make the invention as a whole obvious. The cited combination also fails to make a single aspect of the claimed invention obvious. These failures provide additional evidence that the claimed invention for producing concrete, tangible and useful results is new, novel and non-obvious.

Reason #3 - The third reason the cited combination of documents fails to establish a prima facie case of obviousness that would support the rejection of claims 157, 159, 160, 161, 162, 163, 165, 166, 167, 169, 171, 172, 173, 174, 175, 176, 178, 179 and 180 is that the proposed combination of Baseman and Tamayo would destroy the ability of the invention described by Tamayo to complete its primary function – using an analysis of "relevant" data to provide near-real-time predictions and recommendations to web site visitors (page 35, Reply Brief Appendix, Tamayo C16, L5 – L9). It is well established that *when a modification of a reference destroys the intent, purpose or function of an invention such a proposed modification is not proper and the prima facie case of obviousness cannot be properly made (In re Gordon 733 F.2d 900, 221 U.S.PQ 1125 Fed Circuit 1984).*

As discussed in more detail under reason #1 of this section, the Tamayo invention uses association rules and related techniques to identify other visitors that are somehow similar to a current visitor and develop models that can make predictions about the current visitor on the basis of what the other, "similar" people did or did not do in the past. The prediction about likely behavior is then used to support the development of recommendations, offers, navigation options and advertisements for current web site visitors. The models and other assumptions are also used to identify data that are relevant to predicting a web site visitor's behavior. As described previously, only "relevant" data are integrated for use in web site visitor analysis.

In the 23 July, 2007 Examiner's answer for the instant application, the Examiner has proposed modifying the Tamayo invention by combining it with the Baseman method for strategic supply chain plan development. Because the invention described by Tamayo relies on processing only relevant data, modifying the invention to include all the data required for the strategic supply chain plan development taught by Baseman would increase the size of the datasets by an order of magnitude. The order of magnitude increase in dataset size would then inexorably reduce the processing speed of the Tamayo invention exponentially. In short, the modification proposed by the Examiner would cause an exponential reduction in the processing speeds of the Tamayo invention and would destroy the ability of the Tamayo invention to provide near-real-time predictions and recommendations to web site visitors. Please note that the Examiner's delay in identifying the way in which the document teachings were going to be combined prevented the Appellant from obtaining a declaration to support this assertion.

Because the proposed modification of the Tamayo invention would destroy the intent, purpose and function of the Tamayo invention, the proposed modification is improper and the prima facie case of obviousness cannot be made.

Reason #4 - The fourth reason the cited combination of documents fails to establish a prima facie case of obviousness that would support the rejection of claims 157, 159, 160, 161, 162, 163, 165, 166, 167, 169, 171, 172, 173, 174, 175, 176, 178, 179 and 180 is that the cited combination of documents does not teach or suggest one or more of the limitations for every rejected claim. *MPEP 2142 provides that: in order to establish a prima facie case of obviousness…the prior art reference (or references when combined) must teach or suggest all the claim limitations.* Limitations not taught by the cited documents alone or in combination include:

  1) Claims 157 and 169 (affects 158 - 167 and 170 -181). Limitations not taught include:

determining a combination of risk management activities that optimizes aspects of enterprise financial performance selected from the group consisting of market value, risk and combinations thereof within a constraint of the available capital

Baseman does not teach their optimization within constraints of available capital. Baseman also does not teach market value optimization, risk optimization and combined market value and risk optimization. Tamayo has no relevant teachings;

2) Claims 159 and 171. Limitations and activities not taught include:

wherein a market value further comprises one or more categories of value selected from the group consisting of an current operation, real option, market sentiment and combinations thereof

Baseman does not teach or suggest real options or market sentiment as categories of value that should be managed. Baseman only mentions that real option analysis is a financial analysis technique that has been used by others (see page 55, Evidence Appendix, C5, L32 – L34) and does not use it for analysis. Tamayo has no relevant teachings;

3) Claims 160 and 172. Limitations and activities not taught include:

wherein a risk management activity is selected from the group consisting of establishing one or more risk management control systems, completing one or more risk transfer transactions and combinations thereof

Baseman does not teach risk control systems and/or risk transfer transactions as the focus is on natural hedging and/or the addition of financial analysis to existing programs (see page 55, Evidence Appendix C8, L9);

4) Claims 161 and 173. Limitations and activities not taught include:

wherein establishing each of one or more risk management control systems further comprises identifying a risk reduction activity and optionally establishing a method for implementing said activity in an automated fashion

Baseman does not teach risk control systems as it teaches natural hedging and the addition of financial analysis to existing programs (see page 55, Evidence Appendix C8, L9);

5) Claims 162 and 174. Limitations not taught include:

wherein completing one or more risk transfer transactions further comprises completing activities selected from the group consisting of insurance purchases, derivate transactions, and combinations thereof

Baseman does not teach risk transfer as it teaches natural hedging and the addition of financial analysis to existing programs (see page 55, Evidence Appendix C8, L9);

6) Claims 163 and 175 (affects 164 and 176). Limitations and activities not taught include:

developing a computational model of organization market value by category of value, element of value and external factor by completing a series of multivariate analyses in an automated fashion using at least a portion of the data, and

quantifying a plurality of risks by a category of value using said model, where a category of value is selected from the group consisting of current operation, real option, market sentiment and combinations thereof.

Baseman does not teach the development of a computational model of market value of any kind. Baseman does not teach the real option or market sentiment categories of value. Tamayo has no relevant teachings;

7) Claims 165 and 178. Limitations not taught include:

supporting an optimization of aspects of financial performance selected from the group consisting of current operation value, real option value, market sentiment value and combinations thereof.

Baseman does not teach or suggest categories of value. Baseman does not teach market sentiment and/or real options as a category of value to be managed and optimized. Baseman also does not teach risk optimization and combined market value and risk optimization. Tamayo has no relevant teachings;

8) Claims 166 and 179. Limitations not taught include:

where determining an optimal combination of risk management activities further comprises using … multi-criteria optimization.

Baseman does not teach the use of multi-criteria optimization by teaching that the primary benefit of reducing risk is reducing the discount rate for the corporation – this eliminates the use of separate calculations for risk and value (see page 54, Evidence Appendix C6, L22 – L32); Tamayo has no relevant teachings;

9) Claims 167 and 180. Limitations not taught include:

using one or more shadow prices from a linear programming optimization calculation to identify an optimal budget for risk management activities.

Baseman does not teach or suggest using shadow prices to identify an optimal budget for risk management. Baseman only discusses budgets for inventory management. Tamayo has no relevant teachings.

Reason #5 - The fifth reason that the claims are patentable is that the standard that is being used to evaluate the relevance of prior art for the instant application is different than the standard that was used to evaluate Tamayo and Baseman – an apparent violation of 35 USC 3. The Appellant has noted similar instances of different standards being used for the review and allowance of applications in the related appeals for 09/761,670, 09/940,450 and 10/645,099. It is important to note that the Appellant only makes the comparison shown above to illustrate the point that the above referenced application is not being reviewed under the same standard for prior art relevance that has been used for the review and allowance of other patent applications.

Issue 2 - Whether claims 158, 164, 170 and 177 are patentable under 35 USC 103 over Baseman and Tamayo in view of Packwood (U.S. Patent 7,006,992)?

Claims 158, 164, 170 and 177 are allowable for the first, second, third, fourth and fifth reasons advanced under Issue 1.

Reason # 6 - The sixth reason that claims 158, 164, 170 and 177 are patentable is that the cited combination of documents fails to make the invention as a whole obvious by teaching away from the claimed methods. *MPEP §2141.02 states that: "in determining the difference between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious but whether the claimed invention as a whole would have been obvious."* Furthermore, it is well established that: *A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).* The ways in which the cited documents (Baseman, Tamayo and/or Packwood) lead away from the claimed invention include:

    1) claim 158 and claim 170, the cited documents teach away from:

        wherein measuring a plurality of risks further comprises quantifying risks under scenarios selected from the group consisting of normal, extreme and combinations thereof.

Packwood teaches away from measuring risk under any scenario by tracking the risk factors listed below instead of measuring risks. Baseman teaches away by focusing on the VaR metric.

    2) claim 164 and claim 177, the cited documents teach away from:

        wherein the method further comprises quantifying risk by element of value and external factor where the elements of value are selected from the group consisting of alliances, brands, customers, customer relationships, employees, employee relationships, infrastructure, intellectual property, information technology, partnerships, processes, production equipment, vendors, vendor relationships and combinations thereof

Packwood teaches away from measuring risk by element of value and external factor by tracking the risk factors listed below instead of measuring risks. Furthermore, none of the risk factors are elements of value or external factors (see listing below). Baseman teaches away from measuring risk by element of value and/or external factor by teaching the use of

the VaR metric which produces one number for the limited number of risks it can analyze and by focusing exclusively on the supply chain which is not a listed element of value;

Risk factors considered by Packwood/Classification
 1. late payments received/ not an element of value or external factor
 2. difference between interest rate on savings and on loans/ not an element of value or external factor
 3. rate of turnover of employees/ not an element of value or external factor
 4. days of product in inventory/ not an element of value or external factor
 5. accounts receivable aging/ not an element of value or external factor
 6. number of loans in default/ not an element of value or external factor
 7. gross sales/ not an element of value or external factor
 8. value of old inventory/ not an element of value or external factor
 9. value of returns/ not an element of value or external factor
10. value of inventory losses/ not an element of value or external factor
11. operating costs/ not an element of value or external factor
12. net profit/ not an element of value or external factor
13. latest compliance regulatory exam rating/ not an element of value or external factor
14. quarterly teller over and short count/ not an element of value or external factor
15. open audit and regulatory findings over twelve months old/ not an element of value or external factor
16. variance of year-to-date budget versus actual operating income/ not an element of value or external factor
17. number of branch manager meetings during past twelve months/ not an element of value or external factor
18. current internal audit rating/ not an element of value or external factor
19. number of branches reporting operating losses/ not an element of value or external factor
20. months since last approval of operations policy/ not an element of value or external factor
21. loan allowance as percentage of total loans/ not an element of value or external factor
22. number of loan officers with portfolios greater than selected amount/ not an element of value or external factor
23. asset quality rating/ not an element of value or external factor
24. percent of loans to total assets/ not an element of value or external factor
25. net interest yield on loan portfolio/ not an element of value or external factor
26. number of appraisals not reviewed by in-house reviewer/ not an element of value or external factor
27. mortgage loans with expired hazard insurance/ not an element of value or external factor
28. percentage of total loans outside lending area of the organization/ not an element of value or external factor
29. net interest income as a percent of average assets/ not an element of value or external factor
30. return on common equity/ not an element of value or external factor
31. legal risk self-assessment/ not an element of value or external factor
32. investments as a percent of total assets/ not an element of value or external factor
33. return on assets/ not an element of value or external factor

Reason # 7 - The seventh reason that claims 158, 164, 170 and 177 are patentable is that the cited combination of documents does not teach or suggest one or more of the claim limitations for every rejected claim. *MPEP 2142 provides that: in order to establish a prima facie case of obviousness...the prior art reference (or references when combined) must teach or suggest all the claim limitations.* The limitations not taught are the same limitations listed above under reason #6.

Issue 3 - Whether claims 168, 181, 203, 206 and 208 are patentable under 35 USC 103 over Baseman and Tamayo in view of Ranger (U.S. Patent 6,301,584)?

Claims 168, 181, 203, 206 and 208 are allowable for the first, second, third, fourth and fifth reasons advanced under Issue 1.

Reason # 6 - The sixth reason that claims 168, 181, 203, 206 and 208 are patentable is that the cited combination of documents fails to make the invention as a whole obvious by teaching away from the claimed methods. The ways in which the cited documents (Baseman, Tamayo and/or Ranger) lead away from the claimed invention include:

1) claim 168, 181, 203 and 208, the cited documents teach away from:

using metadata mapping to convert, integrate and store a plurality of enterprise related data from a plurality of enterprise related systems in accordance with a metadata standard (xml or metadata coalition standard)
Ranger teaches away by teaching integration on the basis of data reliability and rules on a one at a time basis instead of using a metadata standard. Ranger also teaches away by using mappings to transform data from a generic format to a specific visual format and does not use mapping for storing data (page 39, Reply Brief Appendix, C9, L30 - 40). Tamayo teaches the preparation, integration and storage of data but teaches away because it does not use metadata, metadata mapping or mapping of any kind in this process. Tamayo does use mapping for the process of feature selection (page 34, Reply Brief Appendix).

2) claim 206, the cited documents teach away from:

wherein a risk management activity is selected from the group consisting of establishing one or more risk management control systems, completing one or more risk transfer transactions and combinations thereof.
As detailed under reason # 2 for issue 1, Baseman teaches away from risk control systems and risk transfer transactions (see page 55, Evidence Appendix C8, L9) while Tamayo and Ranger have no relevant teachings;

Reason # 7 - The seventh reason that claims 168, 181, 203, 206 and 208 are patentable is that the cited combination of documents does not teach or suggest one or more of the limitations for every

rejected claim. *MPEP 2142 provides that: in order to establish a prima facie case of obviousness...the prior art reference (or references when combined) must teach or suggest all the claim limitations.* The limitations not taught are the same limitations listed above under reason #6.

Issue 4 - Whether claims 201, 202, 204, 207, 209 and 211 are patentable under 35 USC 103 over Baseman and Tamayo in view of Ching (U.S. Patent 6,078,901) and claims 205 and 210 are patentable under 35 USC 103 in view of Baseman, Tamayo, Packwood and Ching?

Claims 201, 202, 204, 205, 207, 209, 210 and 211 are allowable for the first, second, third, fourth and fifth reasons advanced under Issue 1.

Reason #6 - The sixth reason that claims 201, 202, 204, 205, 207, 209, 210 and 211 are allowable is that the cited combination of documents teach away from the proposed combination. *MPEP § 2145 X.D.2 provides that: "it is improper to combine references where the references teach away from their combination."* The cited combination of documents teaches away from the proposed combination because Ching teaches that the methods Baseman and Packwood rely on are defective. In fact, Ching teaches that any methods for financial analysis that differs from the ones he teaches are defective so a combination with Ching and any other document teaching a finance related method would be improper (page 40, Reply Brief Appendix, C13, L22 – L35).

Reason #7 - The seventh reason that claims 201, 202, 204, 205, 207, 209, 210 and 211 are allowable is that the cited combination of documents fails to make the invention as a whole obvious by teaching away from the claimed methods. The ways in which Baseman, Tamayo, and Packwood lead away from the claimed invention have already been detailed under issues 1 and 2. Ching teaches away from the claimed methods by teaching that risk, like happiness is a non-monetary return (see page 62, Evidence Appendix Ching, C5, L8 – L12). In making this statement, Ching clearly teaches away from all the claims in the instant application as they all rely on the fact that risk is a negative, monetary return (it is also another way Ching teaches away from the cited combination with Baseman and/or Packwood as both view risk as a negative, monetary return).

Claims 205 and 210 are also allowable for the sixth and seventh reasons listed under issue 2.

Issue 5 - Whether claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167, claim 168, claim 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 are enabled under 35 USC 112, first paragraph?

Claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167, claim 168, claim 169, claim 170, claim 171, claim 172, claim 173, claim 174,

claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 are patentable for at least four separate reasons:

1. The narrative in the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 fails to establish a prima facie case that would support a written description rejection under 35 USC 112 first paragraph for a single claim;

2. The specification and drawings clearly explain to someone of average skill in the art how to make and use the invention described by each of the cited claims;

3. The written description of the instant application is apparently being reviewed under a different standard than that used for the review of similar patent applications, an apparent violation of 35 USC 3; and

4. The narrative in the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 used to support a written description rejection under 35 USC 112 first paragraph fail to comply with the requirements of the Administrative Procedures Act and are therefore moot.

Reason #1 - The first reason that claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167, claim 168, claim 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 are patentable is that the Examiner has failed to establish a prima facie case that the specification does meet the enablement requirements of §112 first paragraph. MPEP 2163 states that: *"A description as filed is presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the examiner to rebut the presumption. See, e.g., In re Marzocchi, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). The examiner, therefore, must have a reasonable basis to challenge the adequacy of the written description. The examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims. Wertheim, 541 F.2d at 263, 191 USPQ at 97. In rejecting a claim, the examiner must set forth express findings of fact regarding the above analysis which support the lack of written description conclusion. These findings should:*

(A) Identify the claim limitation at issue; and

(B) Establish a prima facie case by providing reasons why a person skilled in the art at the time the application was filed would not have recognized that the inventor was in possession of the invention as claimed in view of the disclosure of the application as filed. A

general allegation of "unpredictability in the art" is not a sufficient reason to support a rejection for lack of adequate written description."

The narrative in the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 fails to establish the prima facie case required to sustain a §112 first paragraph rejection in at least three ways that were previously cited in the 30 April 2007 Appeal Brief:

1. No claim limitation(s) at issue have been identified. The Examiner has expressed vague concerns and asked a number questions regarding the specification but no specific claim limitations have been identified as being at issue;

2. No evidence has been presented. As noted above, rejection under §112 first paragraph requires a preponderance of evidence and express findings of fact. In spite of this, no facts have been identified and no evidence has been presented about a specific concern regarding the specification; and

3. Relevant evidence has been ignored. Evidence that the Examiner has apparently ignored includes the summary of claimed subject matter and the explanation of steps used by the method and system of present invention to calculate and optimize risk contained in the 30 April 2007 appeal brief; and a declaration submitted in May 5, 2006 (over 10 months before the notice of appeal was filed)*.

*The Examiner objected to the fact that the declaration was not timely filed and did not list page numbers. Neither of these concerns are valid.

Since the prima facie case to support the claim rejections has not been established, no rebuttal is required. However, it is worth noting that the declaration under Rule 132 provided 16 months ago completely rebuts the allegations made regarding alleged written description deficiencies *"...I have concluded that it would be straightforward for someone of average skill in the art to duplicate the automated risk transfer system using the information in U.S. Patent Application 09/688,983 together with the patent applications and patents it cross-references....."* (see page 47 - 49 , Evidence Appendix).

Reason # 2 - The second reason claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167, claim 168, claim 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 are patentable is that the specification and drawings enable any person skilled in the relevant arts to make and use the invention defined in the rejected claims. The Appellant believes that the description of the support contained in the "Summary of Claimed Subject Matter" section of the appeal brief filed on 30 April 2007 makes it clear that the specification and drawings enable each of the rejected claims.

Because a rejection under §112 first paragraph requires a preponderance of evidence, the vague concerns about the specification should have no impact on the patentability of the claimed invention. In spite of this fact, the Appellant has included a summary in the Reply Brief Appendix that addresses what are believed to be the areas of concern that were identified in the Examiner's reply of 23 July 2007 (note: duplicate concerns were combined). To the extent possible the Appellant has left the Examiner's choice of words intact, however, some editing has been done in an effort to enhance understanding (see pages 30 - 32, Reply Brief Appendix). Eight of the nine areas of concern were fully addressed by the declaration under Rule 132 provided 16 months ago as shown in the table below (see page 47 - 49, Evidence Appendix).

Area of concern	Declaration under rule 132 statement
How to measure a plurality of risks	Application 09/688,983* fully describes how to measure a plurality of risks
How to identify one or more risk management activities based upon risks	Application 09/688,983* fully describes how to identify risk management activities
How the amount of available capital is determined	Application 09/688,983* fully describes how to calculate the available capital
How optimization analyses are completed	Application 09/688,983* fully describes how optimization analyses are completed
How market value is computed	Application 09/688,983* fully describes how market value is computed
How to quantify risk under scenarios including normal and extreme	Application 09/688,983* fully describes how to quantify risk under scenarios including normal and extreme
How the system learns	Application 09/688,983* fully describes how the system learns
How enterprise value and risk is quantified	Application 09/688,983* fully describes how enterprise value and risk is quantified

* Application 09/688,983 together with applications and patents it cross references

The Examiner has also expressed vague concerns about the ability of the claimed invention to process user input and manage data. The Appellant notes that broad similarities of the methods for data collection and management used by the instant application and the methods taught in U.S. Patent 6,732,095 serve as an effective rebuttal to these concerns. This subject is discussed in more detail in the related appeal for application 09/940,450. In spite of this, these vague concerns are also addressed in the summary included in the Reply Brief Appendix.

Reason #3 - The third reason claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167, claim 168, claim 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180

and/or claim 181 are patentable is that the written description of the instant application is being reviewed under a different standard than that used for the review of similar patent applications - an apparent violation of 35 USC 3. To illustrate this point, the table below compares the support in the Baseman and Sullivan specifications to the support in the specification in the instant application for each of the areas of concern identified by the Examiner. The details used to develop this table are included in the narrative on pages 30 - 32 of the Reply Brief Appendix.

Area of concern	Baseman*	Sullivan	Eder
How to measure a plurality of risks	Mentions VaR metric, simulation & reducing discount rate, not clear how or what to use when	No support, relies on pre-developed models created by an unknown process	Ample support
How to identify one or more risk management activities based upon risks	Subjective, basis for decision not fully explained	Subjective, an operator identifies the activities	Ample support
How the amount of available capital is determined	No support	No support as budget is a given	Ample support
How optimization analyses are completed	No support, use of VaR precludes risk optimization	Highest EVA, but does not fully explain how to calculate EVA	Ample support
How market value is computed	No support	Uses EVA, does not fully explain how to calculate it	Ample support
How to quantify risk under scenarios including normal and extreme	No support	No support	Ample support
How the system learns	NA	Classified as artificial intelligence but does no learning	Ample support
How enterprise value and risk is quantified	No support	No support	Ample support
Data input and management*	Provides limited support	No support	Ample support

* Tamayo used as the basis of comparison for data management in place of Baseman

It is important to note that the Appellant only makes the comparison shown above to illustrate the point that the above referenced application is not being reviewed under the same standard for written description that has been used for the review and allowance of other patent applications.

<u>Reason #4</u> - The fourth reason that that claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167, claim 168, claim 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 are patentable is that the assertions regarding the alleged lack of enablement are not in compliance with the requirements of the Administrative Procedures Act and are therefore moot. In Dickinson v. Zurko, 119 S. Ct. 1816, 50 USPQ2d 1930 (1999), the Supreme Court held that the appropriate standard of review of PTO findings are the standards set forth in the Administrative Procedure Act ("APA") at 5 U.S.C. 706 (1994). The APA provides two standards for review – an arbitrary and capricious standard and a substantial evidence standard. The Appellant respectfully submits that the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 fails to meet both standards. As detailed in the preceding paragraphs, the basis for the rejections contained in 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 fails under the substantial evidence standard because no evidence has been presented. Instead of express facts and evidence the Examiner has presented a vague list of concerns. The Examiner has also refused to consider evidence presented 16 months ago that completely rebuts his assertions.

The Appellant also respectfully submits that a review of the prosecution history of this application and history of the related appeals makes it clear that any reliance on the written description rejections contained in the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 would also fail under the second standard of the APA – the arbitrary and capricious standard. Reasons the written description rejections contained in the Examiner's reply of 23 July 2007 would fail under the arbitrary and capricious standard include:

a) patents are documents that teach those of average skill in the art how to make and practice an invention. Understanding how to make and practice an invention includes understanding how to properly combine an invention with other inventions. Conversely, the inability to identify a proper combination of patents provides evidence that the individual or organization proposing the combination(s) lacks a level of skill in the art that is at least the average level required to make meaningful comments regarding a written description or claim.

b) in the process of developing the agency's fact-findings for the instant application and related application 10/329,172 the Examiner has been unable to identify a specific claim limitation at issue and has made seventeen consecutive, unsuccessful attempts (including five in the current reply brief) to identify a proper combination of patents to support a plurality of claim rejections for obviousness. Eight of these combinations include the Ching reference, 15 include a VaR related reference. Given these facts and a) above, his comments are moot.

c) in the process of developing the agency's fact-findings for the instant application and related appeals TC 3600 has made over forty consecutive, unsuccessful attempts to identify a proper combination of patents to support a plurality of claim rejections for obviousness. The most

recent being the improper combination used to support the rejection of pending claims for the related appeal for application10/282,113. Given this fact and a) above, their comments are moot.

Because the preponderance of evidence developed by the agency makes it clear that those authoring the claim rejections do not have the level of skill required to provide meaningful comments regarding a written description, these rejections also fail under the arbitrary and capricious standard.

Issue 6 – Whether claim 201, claim 202, claim 203, claim 204, claim 205, claim 206, claim 207, claim 208, claim 209, claim 210, claim 211, claim 212 and/or claim 213 are enabled under 35 USC 112, first paragraph?

Claim 201, claim 202, claim 203, claim 204, claim 205, claim 206, claim 207, claim 208, claim 209, claim 210, claim 211, claim 212 and/or claim 213 are allowable for the first, third, and fourth reasons advanced under Issue 5.

Reason #4 - The fourth reason claim 201, claim 202, claim 203, claim 204, claim 205, claim 206, claim 207, claim 208, claim 209, claim 210, claim 211, claim 212 and/or claim 213 are patentable is that the specification and drawings enable any person skilled in the relevant arts to make and use the invention defined in the rejected claims. The Appellant believes that the description of the support contained in the "Summary of Claimed Subject Matter" section of the appeal brief filed on 30 April 2007 makes it clear that the specification and drawings enable each of the rejected claims.

Issue 7 - Whether the invention described in claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167 and/or claim 168 represents patentable subject matter under 35 USC 101?

Claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167 and claim 168 represent patentable subject matter and are patentable for at a number of reasons including:

1. Because the Examiner has failed to establish a prima facie case that the claimed invention is not concrete;

2. Because arguments supporting the 35 USC 101 claim rejections fail to comply with the requirements of the Administrative Procedures Act and are therefore moot;

3. Because the subject matter eligibility of the instant application is apparently being reviewed under a different standard than that used for the review of similar patents, an apparent violation of 35 USC 3, and

4. Because the claimed invention transforms transaction data into a specific set of recommendations for optimizing risk management activities and enterprise financial performance.

<u>Reason #1</u> - The first reason claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167 and claim 168 are patentable is that the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 have failed to establish a prima facie case of non-statutory subject matter for the rejected claims. It is well established that *"the examiner bears the initial burden ... of presenting a prima facie case of unpatentability." In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).* The Appellant respectfully submits that the Examiner has not provided any evidence to support his assertions and as a result has failed to meet the burden of establishing a prima facie case that the claims are non-statutory. Instead of providing the evidence required to establish a prima facie case, the Examiner simply expressed vague concerns and asked a few questions. The concerns and questions were the same questions offered in an attempt to question the written description as discussed previously under issue 5. The determination of non-statutory subject matter also appears to rely on two unsupported statements:

1. The results (optimizing) in the present application do not produce concrete results – particularly for intangible elements of value (brands) and market sentiment, and

2. The results of applicant's invention in arriving at a probable success factor is clearly not the same results found in State Street Bank & Trust Co. V. Signature Financial group.

The two statements, the questions and the vague comments amount to innuendoes regarding an alleged lack of utility. *MPEP 2164.07 states "the examiner has the initial burden of challenging an asserted utility. Only after the examiner has provided evidence showing that one of ordinary skill in the art would reasonably doubt the asserted utility does the burden shift to the applicant to provide rebuttal evidence sufficient to convince one of ordinary skill in the art of the invention's asserted utility. In re Brana, 51 F.3d 1560, 1566, 34 USPQ2d 1436, 1441 (Fed. Cir. 1995) (citing In re Bundy, 642 F.2d 430, 433, 209 USPQ 48, 51 (CCPA 1981)).* Given the complete absence of evidence the Appellant respectfully submits that the Examiner has failed to establish the required prima facie cause of non-statutory subject matter for the rejected claims.

<u>Reason #2</u> - The second reason claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167 and claim 168 are patentable is that the assertions regarding the alleged non-statutory subject matter are not in compliance with the requirements of the Administrative Procedures Act and are therefore moot. *In Dickinson v. Zurko, 119 S. Ct. 1816, 50 USPQ2d 1930 (1999), the Supreme Court held that the appropriate standard of review of PTO findings of fact are the standards set forth in the Administrative Procedure Act*

("APA") at 5 U.S.C. 706 (1994). The APA provides two standards for review – an arbitrary and capricious standard and a substantial evidence standard. The Appellant respectfully submits that the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 fails under both standards. As discussed under reason #1, the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 fail under the substantial evidence standard because they do not provide a scintilla of evidence to support the innuendos that any aspect of the invention is not concrete.

The Appellant also respectfully submits that the 35 USC 101 rejections would also fail under the second standard of the APA, the arbitrary and capricious standard. *Under that standard, the reviewing court analyzes whether a rational connection exists between the agency's fact-findings and its ultimate action.* Reasons these claim rejections would fail under the second standard include:

a) There is no rational connection between the vague concern about concretely measuring and managing value and risk for intangible elements of value (i.e. brands) and the agency's fact-findings in Donner and in the related appeal for application 10/329,172. The claims in 10/329,172 are rejected at least in part because the Examiner contends the measuring and managing risk for the listed intangible elements of value is "old and well known" (see page 52, Evidence Appendix). The Appellant respectfully disagrees with the Examiner's contention. However, it is still clear that there is no rational connection between the vague concerns regarding intangible elements of value and the related fact-findings of the U.S.P.T.O.;

b) There is no rational connection between the vague concern about concretely measuring and managing value and risk for the market sentiment category of value and the agency's fact-findings in the related appeal for application 09/761,671. The Examiner for that application has identified a document (Brown) that teaches that the market value of equity can be reliably modeled using some of the same algorithms used in the instant application. Market sentiment can readily be derived from the market value of equity by the innovative system of the present invention. Because of these facts, it is clear that there is no rational connection between the vague concern regarding the market sentiment category of value and the related fact-findings of the U.S.P.T.O.; and

c) There is also no rational connection between the vague concern about concretely identifying changes that will optimize market value, risk and combinations thereof of and the agency's fact-findings during the prosecution of the Baseman application. The agency found that the Baseman supply chain plan development process that discussed the use of some of the same algorithms for value optimization was concrete. Because of this fact, it is clear that there is no rational connection between the vague concern regarding optimization contained in the instant reply brief and the related fact-findings of the U.S.P.T.O.

In short, the agency's own fact-findings make it clear that the decision to issue rejections for these claims under 35 USC 101 also fails under the arbitrary and capricious standard.

Reason #3 - The third reason claims 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167 and claim 168 are patentable is that the concreteness of the instant application is apparently being reviewed under a different standard than that used for the review of similar patents - an apparent violation of 35 USC 3. As discussed previously under issue 5 and as detailed on pages 30 - 32 of the Reply Brief Appendix, a comparison of the instant application with two other issued applications for similar subject matter clearly shows that the instant application provides a more complete, concrete explanation of each of the steps needed to complete the claimed methods. It is important to note that the Appellant only makes the comparison shown above to illustrate the point that the above referenced application is not being reviewed under the same standard that has been used for the review and allowance of other, similar patent applications.

Reason #4 - The fourth reason claim 157, claim 158, claim 159, claim 160, claim 161, claim 162, claim 163, claim 164, claim 165, claim 166, claim 167 and claim 168 are allowable is that the claimed invention is an article of manufacture that systematically transforms transaction data into a set of specific recommendations for optimizing enterprise risk and/or market value. As noted in the *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility* "the Supreme Court noted that one example of a statutory "process" is where the process steps provide a transformation or reduction of an article to a different state or thing (Diehr, 450 U.S. at 183, 209 USPQ at 6). In Alappat, the Court held that "data, transformed by a machine" "to produce a smooth waveform display" "constituted a practical application of an abstract idea." State Street, 149 F.3d at 1373. In Arrhythmia, the Court held "the transformation of electrocardiograph signals" "by a machine" "constituted a practical application of an abstract idea." Id. Likewise, in State Street, the Court held that "the transformation of data" "by a machine" "into a final share price, constitutes a practical application of a mathematical algorithm." Id. Thus, while Diehr involved the transformation of a tangible object - curing synthetic rubber - the Court also regards the transformation of intangible subject matter to similarly be eligible, so long as data or signals represent some real world activity. It is the Appellant's understanding that the PTO views this "data transformation" test as an appropriate way to evaluate subject matter eligibility (In re Comiskey, No. 2006- 1286). The Appellant also notes that in addition to passing the data transformation test, the specification and claims define a substantial, specific utility for the

claimed invention – systematically improving real world financial performance and as a result the claims represent statutory subject matter.

Issue 8 - Whether the invention described in claims 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 represents patentable subject matter under 35 USC 101?

Claim 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 represent patentable subject matter and are patentable for the first second and third reasons advanced under issue 7.

Reason #4 - The fourth reason claim 169, claim 170, claim 171, claim 172, claim 173, claim 174, claim 175, claim 176, claim 177, claim 178, claim 179, claim 180 and/or claim 181 are allowable is that the claimed invention is machine that systematically transforms transaction data into a set of specific recommendations for optimizing enterprise risk and/or market value. The Appellant also notes that in addition to passing the data transformation test, the specification and claims define a substantial, specific utility for the claimed invention – methodically improving real world financial performance and as a result the claims represent statutory subject matter.

Issue 9 - Whether the invention described in claim 201, claim 202, claim 203, claim 204, claim 205 and/or claim 206 represents patentable subject matter under 35 USC 101?

Claim 201, claim 202, claim 203, claim 204, claim 205 and/or claim 206 represent patentable subject matter and are patentable for the first second and third reasons advanced under issue 7.

Reason #4 - The fourth reason claim 201, claim 202, claim 203, claim 204, claim 205 and/or claim 206 are allowable is that the claimed invention is that the claimed invention is a process that systematically transforms transaction data into a set of values for risks and elements of value that are useful for optimizing risk management and/or enterprise market value. The Appellant also notes that in addition to passing the data transformation test, the specification and claims define a substantial, specific utility for the claimed invention – systematically creating the information needs to improve real world financial performance and as a result the claims represent statutory subject matter.

Issue 10 - Whether the invention described in claim 207, claim 208, claim 209, claim 210, claim 211, claim 212 and/or claim 213 represents patentable subject matter under 35 USC 101?

Claim 207, claim 208, claim 209, claim 210, claim 211, claim 212 and/or claim 213 represent patentable subject matter and are patentable for the first second and third reasons advanced under issue 7.

Reason #4 - The fourth reason claim 207, claim 208, claim 209, claim 210, claim 211, claim 212 and/or claim 213are allowable is that the claimed invention is that the claimed invention is a process that systematically transforms transaction data into a set of values for risks and elements of value that are useful for optimizing risk management and enterprise market value. The Appellant also notes that in addition to passing the data transformation test, the specification and claims define a substantial, specific utility for the claimed invention – methodically creating the information needs to improve real world financial performance and as a result the claims represent statutory subject matter.

Issue 11 – Whether pending claim 211 is unpatentable under the statutory double patenting prohibition given pending claim 204?

The claims are patentable because claims 204 and 211 are each dependent claims that each limit a different independent claim that has a different scope. MPEP 706.03(k) states in part that: *"court decisions have confirmed applicant's right to restate (i.e., by plural claiming) an invention in a reasonable number of ways. Indeed, a mere difference in scope between claims has been held to be enough."*

Issue 12 – Other informality considerations

Item 3 on page 8 of the 3 January 2007 Office Action and the Examiner's reply of 23 July 2007 contains claim objections regarding the alleged improper dependent form of claims 212 and 213. This objection has been obviated by the 1 February 2007 amendment that corrected a typo. The corrected claims are included in the Claim Appendix in the 30 April 2007 Appeal Brief.

Please note: The prosecution of other applications in the Asset Trust portfolio has identified additional documents. However, given the newly announced emphasis on disclosing only "non-cumulative" documents, the Appellant has elected not to disclose a number of U.S. Patents including 5,148,365; 5,508,731; 5,779,287; 5,873,070; 5,930,774; 6,026,388; 6,205,150; 6,401,070; 6,456,982; 6,457,049; 6,591,232; 6,684,193; 6,742,054 and 7,162,427 as well as the non-patent-literature produced for applications 10/166,758; 10/237,021 and 10/743,616.
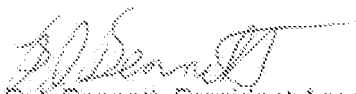
Conclusion

As detailed above, the evidence used to support the art rejections of the pending claims consists of five improper combinations of documents. There is a similar dearth of evidence to support the non-art rejections of the pending claims. The Appellant also notes that with respect to the prosecution of the instant application, it appears that the U.S.P.T.O. has not fully complied with the requirements set forth in the APA, 35 USC 3 and 35 USC 131. Among other things, the Appellant specifically notes that:

a) At least some of the claims appear to be misclassified under class 705;

b) There appears to have been repeated violations of MPEP 904.03;

c) The prior art, written description and statutory subject matter eligibility of the instant application appears to have been reviewed under a different standard than that used for the review and allowance of other applications;

d) The Examiner has refused to review a declaration from an expert with a background relevant to the instant application that was submitted 16 months ago; and

e) The Examiner and the Technology Center were allowed to enter rejections under 35 USC 112 first paragraph in spite of substantial evidence that they lack the level of skill in the art required to make meaningful statements regarding a written description.

In short, relevant evidence has been ignored, excluded, and/or not considered while irrelevant and misleading information has been entered into the record. For the extensive reasons advanced above, the Appellant respectfully but forcefully contends that each claim is patentable. Therefore, reversal of all rejections is courteously solicited.

Respectfully submitted,

B.J. Bennett, President Asset Trust, Inc.

Dated: October 14, 2007

Reply Brief Appendix

Summary

The listing below was originally created to address the Examiner's concerns regarding the written description. However, upon review it is clear that it is most useful for memorializing the fact that the written description for the instant application has been reviewed under a different standard for written description than the standard that was used for Baseman (class 705), Sullivan (class 706) and Tamayo (class 707). In every case the instant application provides a more complete description and more detailed support.

Area of concern #1: how to measure a plurality of risks
Baseman: <u>provides confusing support</u>, the VaR metric is the principal risk measurement technique, other techniques mentioned but not explained include: simulation, relative price comparisons and changing the discount rate on the basis of risk reduction, <u>not clear what method to use when or how the methods are to be used</u>,   Sullivan: provides little or no support, risk models are pre-developed according to various business classes and functional segments <u>using some unknown process</u> (see page 67, Evidence Appendix, C9, L 29 – 41),   Eder*: contingent liability values are obtained from an advanced finance system (line 16 – 20, page 20 of specification). The specification also describes how to calculate contingent liability values using real option algorithms (line 25 – 30, page 67 of the specification). The unique models from area of concern #8 are used to simulate performance using the scenarios created by the novel scenario development method described under area of concern #6 in order to quantify the remaining risks.

Area of concern #2: Identifying one or more risk management activities based upon said risks
Baseman: does not describe this function, the Baseman method is a systematic subjective process that is focused on long term decision making and/or adding financial concerns to existing activities. Baseman does not identify activities based on risks, it identifies areas and then uses financial analysis techniques to see if they will provide a benefit,   Sullivan: pre-defined risk controls and custom developed risk controls are created using some unknown process by an operator who is working to maximize EVA, these work together with the models created as described in area 1 using some unknown process,   Eder*: bots (FIG. 7, reference number 404, page 80, line 10 – page 81, line 2) are used to identify options for change that will reduce the identified risks. Data from risk management systems may also be used to identify areas for reduction in a manner that is well known.

Area of concern # 3: how the amount of capital available for risk management is calculated
Baseman: does not describe how to calculate the amount of capital available for risk management,   Sullivan: does not describe how to calculate the amount of capital available for risk management, the budget available for risk control is a given,   Eder*: calculating the amount of capital is described in FIG. 7B reference number 443 and line 12, column 12 through line 10, column 93 of cross referenced U.S. Patent 5,615,109. The advanced finance system would normally have the amount of available capital already calculated and available as well as having the relevant budget information.

Area of concern # 4: how optimization analyses are completed
Baseman: mentions optimization algorithms but does not explain how to complete an optimization, the heavy reliance on the VaR metric and the teaching that risk reductions reduce the cost of capital precludes risk optimization and combined value/risk optimization,   Sullivan: set of risk control programs with the highest EVA is optimal, unfortunately Sullivan does not fully explain how to calculate EVA,   Eder*: the system uses a linear programming model to complete optimization analyses using previously developed risk information from area 1. Multi criteria optimization (cross referenced patent 5,615,109) is used for combined value and risk optimization.

Area of concern #5: how market value is computed
Baseman: mentions value but does not explain how to calculate it, Baseman does not mention market value and does not explain how to calculate it,   Sullivan: Focuses on EVA but does not fully explain how to calculate it as the specification does not explain of how and when to calculate the 160 plus adjustments to EVA that are required to calculate the correct number,   Eder*: As shown in Table 3 on page 10 of the specification, the current market value of equity securities and the current value of debt are obtained in a manner that is well known. These totals are then combined to calculate market value.

Area of concern #6: quantification under scenarios how is it quantified; what are normal and extreme
Baseman: does not describe how to generate a scenario or what type to generate, mentions the use of exchange rate scenarios for a specific kind of profit optimization analysis (see Page 55, Evidence Appendix, C8, L24),   Sullivan: does not discuss scenarios,   Eder*: As described in FIG 6A, FIG 7 and line 1, page 59 through line 35, page 82 of the specification, the causal factors are identified and then analyzed to identify their volatility under normal conditions and under extreme conditions. The causal factor volatility information is combined with the previously stored generic risk information to develop scenarios for quantifying enterprise risk.

Area of concern #7: where learning is explained, how does system learns
Baseman: is a process for business plan development by humans and all decisions and learning are subjective,   Sullivan: is classified as an artificial intelligence application but does no learning,   Eder*: A number of different types of learning are clearly described in FIG. 6A, 6B and 6C and the analysis bots section (pages 50 – 78 of the specification).

Area of concern #8: how enterprise value is quantified
Baseman: lists a variety of financial techniques but does not describe how to quantify the value of the enterprise as a whole or by category of value, real option, element of value or external factor,   Sullivan: does not describe how to quantify the value of the enterprise as a whole or by category of value, real option, element of value or external factor,   Eder*: As described in FIG. 6A, FIG. 6B and FIG. 6C and on pages 50 through 78 of the specification, causal models are used to identifying the contribution of elements of value and market value factors to the current operation and market sentiment categories of value while their impact on real option values are determined using calculated interest rates.

Note: because Baseman is not a system, Tamayo will be used as the basis for comparison in the final area of concern.

Area of concern #9: how data are input, gathered and managed
Tamayo: data are collected and integrated from a corporate database, external database and a web transaction database, text and responses received from users are mentioned but not explained, data assumed to be unnecessary are removed, remaining data are converted to a plurality of schemas w/o explanation as to where schemas were developed, metadata is not mentioned, mapping to/from data sources is not mentioned, the data connection is not identified or explained, control of the data integration process is not explained;   Sullivan: predefined models are stored in a knowledgebase using an unknown process, text and responses received from users are mentioned but not explained, the models created by the operator using an unknown process are stored using some unknown process, the pre-defined risk controls and custom developed risk controls are created and stored using some unknown process, combinations of models and controls are also developed using an unknown process by an operator;   Eder*: After the organization is defined via the system settings (see table 15, page 31) and the metadata standard selected, metadata mapping and conversion relationships are established for each internal and external database and the Internet, data are aggregated and then stored in accordance with a common schema via a network connection using the schedule established in system settings, text obtained from the Internet is handled as shown in FIG 5D, other text and responses are handled via the data windows (701 – 710, 712 and 715) in a manner that is well known.

*Please note: in all cases the summary of claimed subject matter in the 30 April 2007 Appeal brief provides a more detailed summary re: the Eder specification and drawings, in some cases it also provides more information about the Sullivan and Baseman specifications.

As noted previously, the comparison shown above is most useful in documenting U.S.P.T.O. bias in favor of large corporations. The vague concern about computer software provides even more evidence of this fact. In a manner that is well known, a computer would be programmed by following the information in the specification that clearly describes the order of the processing steps, the source of data for each step, the activity completed at each step and the location where data are to be stored after each step. The flowcharts in the drawings re-enforce and supplement the information in the specification. It is well established that a specification and a flowchart provide sufficient information to enable the development of a computer software program. Finally, the Appellant would like to note that KSR v Teleflex has raised the level of knowledge that can reasonably be expected from someone of average skill in the art.

to numerous problems in corporate and database mining such risk assessment, attrition and retention modeling, campaign marketing, fraud detection, customer profiling, profitability and cross-selling. These application problems are usually viewed from an account- or user-centric point of view. All the relevant information for each user is merged and consolidated in one record. An input dataset then looks like a large, mostly populated two-dimensional table where the columns correspond to attributes (independent variables). In the supervised learning approach, one particular column provides the 'target' that is used as the dependent variable for the Data Mining model. Association modeling attempts to find associations: common patterns and trends in a less structured way (i.e. independent of a particular target field). These associations are supported by statistical correlations between different attributes of the dataset and are extracted by imposing independence, support, and confidence thresholds. Association analysis is applied to transaction or market basket data typically. In this case the datasets consists of transaction data listing a basket or group of items corresponding to an individual sale. The dataset is again a two-dimensional table but in this case potentially very sparse. Clustering is used for data-reduction and for class discovery. It is a method to find general correlation structures that group records into similarity groups. Clustering can be applied to both account or transaction-based datasets. Most data mining tool-sets support algorithms that provide instances of these paradigms but it is not common to encounter the three paradigms in a single problem.

Enterprise web mining (EWM) in its most general realization involves a collection of data intensive data sources and repositories with corporate, warehousing and web-transaction components. As a consequence of this heterogeneity the present invention must incorporate these data sources in a way suitable to support the three learning paradigms and also allow the system to solve different types of mining problems along the spectrum of web enterprises shown in FIG. 3. On one side of the spectrum the present invention provides the capability to perform traditional data mining modeling on corporate RDBMS augmented by account-centric web data. For example, modeling of attrition in a phone company. On the other side of the spectrum the present invention provides the capability to perform pure transactional association analysis such as the one needed in sites such as search engines. Most web sites and corporate enterprises are somewhere in the middle.

Thus, the present invention provides the capability to

Extract session information from web server data.

Transform a web site visitor's behavior into data about his preferences.

Integrate web transactions and browsing behavior data with customer information and demographics

Support a variety of mining problems (e.g., cross-selling, up-selling, market segmentation, customer retention, and profitability) that use as input web and corporate data.

Help discover interesting and relevant patterns, clusters, and relationships in the transaction and user customer data.

An important function performed by the present invention is to integrate many existing information gathering, storage and decision elements in a coherent way. In order to do this, the methodology in the integration process and in the user interface must be defined.

It is useful to distinguish three types of web mining. Web mining consisting of web-deployed traditional data mining provides the capability for web pages to use results of segmentation models for advertisements, cross-selling, etc. Web mining consisting of data-mining of click stream data provide the capability to generate statistical usage reports, on-line personalized recommendations, and on-line personalized navigation and general content. Full-fledged Enterprise Web Mining, as provided by the present invention, provides the capability to integrate traditional mining and click stream and conceptual classes encompassing the entire corporate/web customer life-cycle, including acquisition, cross-selling, and retention. In addition, it provides the capability to implement a dynamically personalized virtual store with artificial intelligence sales agents.

Another important aspect of the present invention is the personalization application. The personalization application is an integrated software application that provides a way for a Web site to customize—or personalize—the recommendations it presents to Web site visitors and customers.

Recommendations are personalized for each visitor to the Web site. This has distinct advantages over tailoring recommendations to broad, general market segments. Recommendations are based on a visitor's data and activity such as navigational behavior, ratings, purchases, as well as demographic data.

The personalization application collects the data and uses it to build predictive models that support personalized recommendations of the form "a person who has clicked links x and y and who has demographic characteristics a and b is likely to buy z".

The personalization application incorporates visitor activity into its recommendations in real time—during the Web visitor's session. For example, the personalization application records a visitor's navigation through the Web site, noting the links that are clicked, etc. All this is data stored for that visitor. The visitor may respond to a Web site's request to rate something, e.g., a book or a movie; the rating becomes part of the data stored for that visitor. All the Web-based behavior for the visitor is saved to a database, where the personalization application uses it to build predictive models. This data can be updated with data collected in subsequent sessions, thereby increasing the accuracy of predictions.

The personalization application works in conjunction with an existing Web application. The Web application asks the personalization application to record certain activities, and the data is saved by the personalization application into a schema. The Web application asks the personalization application to produce a list of products likely to be purchased by a Web site visitor; a scored list of recommendations compiled from the visitor's current behavior and from data in another schema is passed to the Web application. A third schema maintains administrative schedules and activities.

The personalization application collects four kinds of data:

navigational behavior

ratings

purchases

demographic data

Of these, navigational behavior allows the most flexibility. It can represent anything the Web application wants to consider a hit (e.g., viewing a page, clicking a link/item, etc.).

Visitors to the Web site are of two types: registered visitors (customers) and unregistered visitors (visitors). For customers, the personalization application has both data from a current session and historical data collected over time for a given customer, as well as demographic data. For

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batch trained. In addition, a self organizing map clustering module provides the capability to address segmentation and profiling. The supported web mining methodologies provide the capability to perform a wide range of end-use functions. For example, the present invention may support the on-line customer lifecycle, which includes elements such as customer acquisition, customer growth, customer retention and lifetime profitability. Additional examples include click through optimization or web site organization.

Reporting engine 910 provides a variety of reports and results summaries, such as site statistics, browser to buyer conversion by time period, recommendation effectiveness by time period, most active cross-sold products by time period, and products for cross-selling by product.

Web portal pages 912 provides a main graphical user interface (GUI) and access to all the components of the system. Web portal page 912 is structured as a collection of portlets that serve as entry points to the main components. Each component in turn has a main page where the main operations and parameters are exposed as part of the web page content. In these components pages customization is available, for example by "check box" selection. Aspects of a web site's personalization process are managed through the portal pages 912, which are implemented with a GUI and interface with the other major components.

Framework

FIGS. 9, 10, and 11 illustrate different aspects of the present invention and are best viewed in conjunction. FIG. 9 is an example of physical and logical components that are combined to form the enterprise web mining system of the present invention. FIG. 10 is an example of the data flow in the enterprise web mining system of the present invention. That is, FIG. 9 represents the physical and logical components that make up the enterprise web mining system, while FIG. 10 represents the data stored in and generated by, and the processing performed by, the physical and logical components shown in FIG. 9. FIG. 11 is a flow diagram of the processing performed by the physical and logical components shown in FIG. 9. This processing is also illustrated in FIG. 10.

Referring to FIG. 10, which is an exemplary data flow diagram of the methodological and technical framework of the enterprise web mining system 1000, implemented in the system shown in FIG. 9, system 1000 includes a plurality of data sources, such as corporate customer data 1002, which is typically provided by corporate database 914, complementary or external customer data 1004, which is typically provided by external databases 916, web server data 1006, which is typically provided by web database 919, and web transaction and visitor data 1008, which is typically provided by web transaction database 918. System 1000 includes a plurality of data processing blocks, such as feature selection and mapping blocks 1010 and 1012 and web data preprocessing block 1013, which are typically implemented in data preprocessing engine 903. System 1000 includes a plurality of data tables, such as account based table 1014, transaction based table 1016, and transaction summary table 1018, which are typically stored in webhouse 904. System 1000 includes a plurality of untrained data mining models, such as supervised learning model 1022, clustering model 1024, association model 1026, and statistical analysis model 1028, which are typically processed (trained) by data mining engine 908. System 1000 includes a plurality of trained data mining models, such as statistical summaries 1030, association rules 1032, clusters/segments 1034, and scoring models and rules 1036, as well as reports, visualizations, scores and deployed models that are included

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in block 1040. The trained data mining models are typically processed by data mining engine 908, which generates the deployed models in block 1040. The deployed models are used by real time recommendation engine 924 to generate dynamic web pages, predictions, and recommendations 1042. The reports in block 1040 are typically generated by reporting engine 910. Other online processing is performed by online analytical processing (OLAP) engine 1038.

Turning now to FIG. 11, which is an exemplary flow diagram of a process 1100 for enterprise web mining, which is implemented in the framework shown in FIG. 10. The four main steps of process 1100 are data collection 1102, data integration 1104, model generation 1106, and online recommendation 1108. FIG. 10 and 11 will be described together and are best viewed in conjunction. Reference will also be made to physical and logical elements of FIG. 9. Process 1100 begins with step 1102, in which data is collected and processed to generate data in a form usable by the remaining steps of process 1100. Step 1102 includes a plurality of steps. Step 1102 begins with step 1102-1, in which data is acquired from the data sources with which system 1000 operates, such as data sources 902, shown in FIG. 9. The data sources include corporate database 914, which provides corporate customer data 1002, external databases 916, which provides complementary customer data 1004, Web transaction database 918, which provides web transaction and visitor data 1008, and Web server database 919, which provides web server data 1006. The data obtained from the data sources is represented as blocks 1002, 1004, 1006, and 1008 of system 1000. In step 1102-2, data that is relevant to the desired output from the system is selected from among the data that has been acquired. In step 1102-3, the selected data is pre-processed to ensure that the data is usable, properly formatted, etc. The processing performed in steps 1102-2 and 1102-3 is represented by blocks 1010, 1012, and 1013 of system 1000 and is typically performed by data preprocessing engine 903. In step 1102-4, the data tables that are used by the system, such as tables 1014, 1016, and 1018 of system 1000, are built and typically are stored in webhouse 904.

Step 1104 of process 1100 involves integrating the different types of data that have been collected to form an integrated database that contains all collected data in a coherent format. For example, web based data may be integrated with account based data for each user. Likewise, data for different types of users, who have different amounts and types of data, may be integrated. The integrated data formed includes account based tables 1014, transaction based tables 1016 and transaction summaries 1018. This data is typically stored in webhouse 904.

Step 1106 of process 1100 involves generating and deploying the models that are used to perform online recommendation and prediction. The processing of step 1106 is typically performed by data mining engine 908. Step 1106 includes a plurality of steps. Step 1106 begins with model setup step 1106-1, in which the algorithms that are to be used to generate the models are selected and setup. Once the algorithms and corresponding data structures are selected and setup, they may be viewed as untrained models, such as models 1022, 1024, 1026, and 1028. In step 1106-2, the representations that make up the trained models, such as information defining the logic, conditions, and decisions of the models, are generated using training data. These trained models may include statistical summaries 1030, association rules 1032, clusters/segments 1034, and scoring models and rules 1036. In step 1106-3, the representations of the generated models, such as blocks 1030, 1032, 1034, and 1036
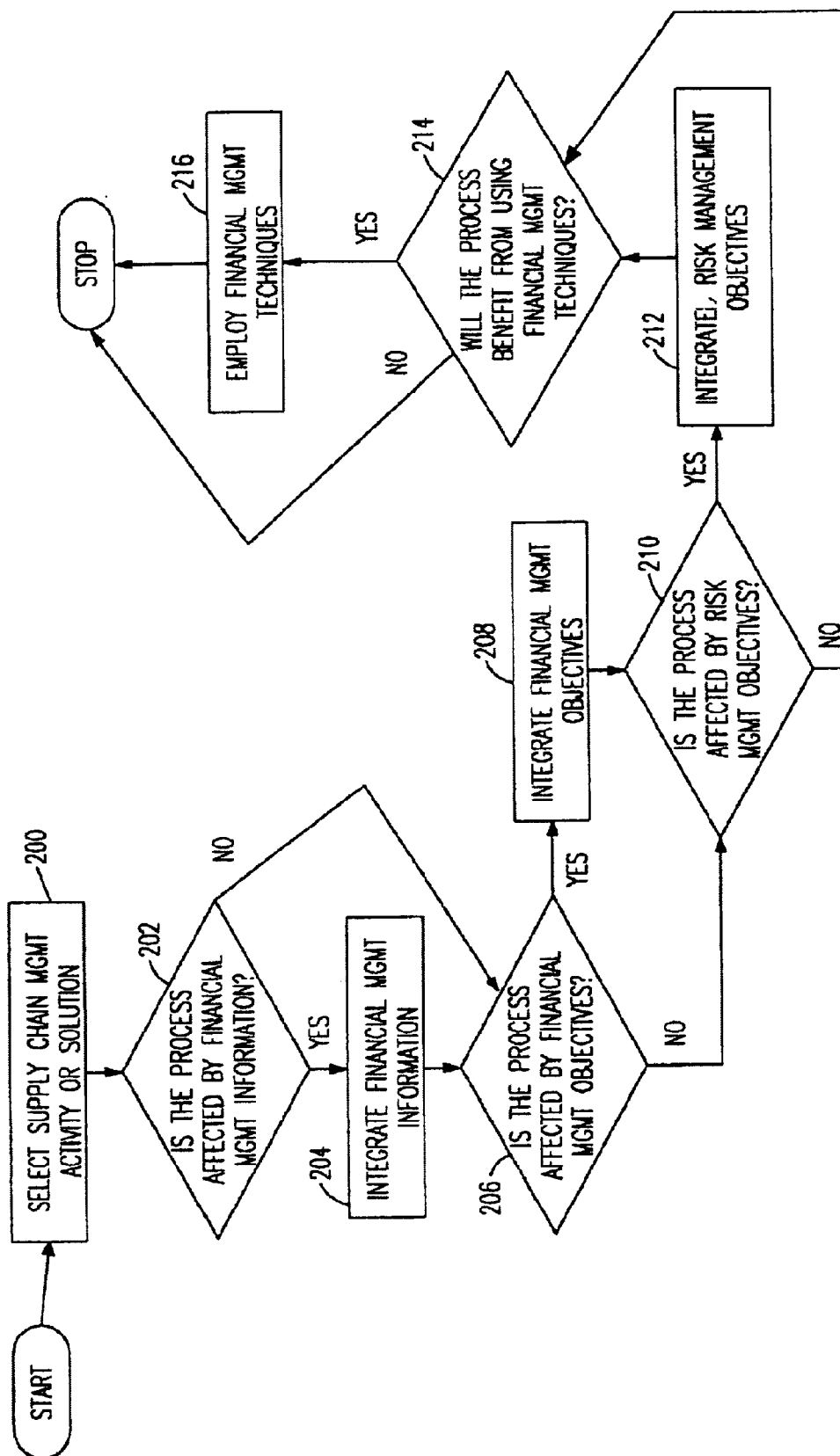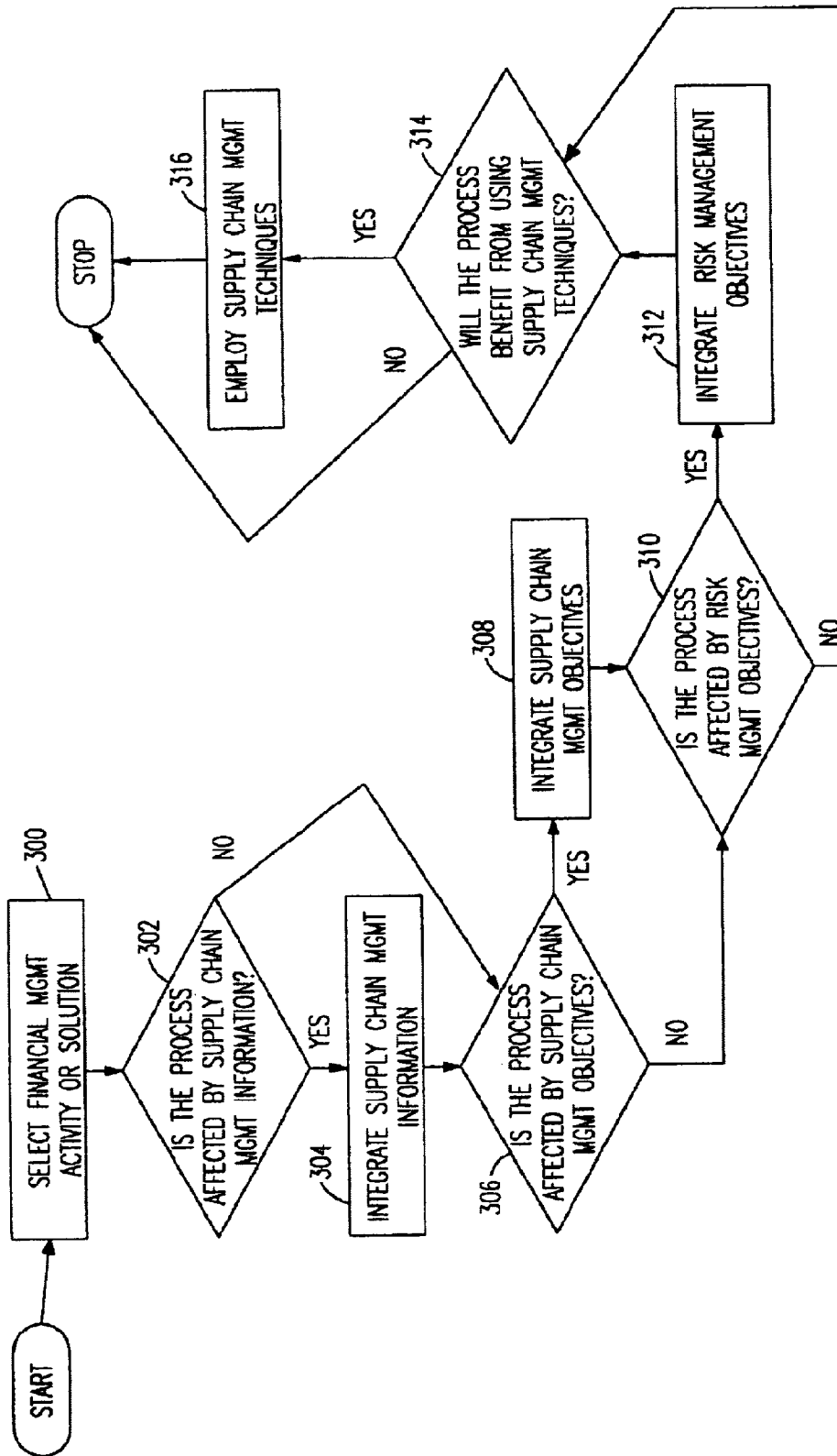
FIG. 2

FIG. 3

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product pricing, customer selection, targeting distribution channels, etc.;

Corporate-wide budgeting—Investment planning and budgeting for the entire enterprise. Tracks available budgets, and compares planned and incurred costs;

Cash Management—Provides information on sources and uses of funds to ensure liquidity to meet payment obligations. Supplies data for managing short-term investments and borrowing;

Treasury Management—Manages the treasury function, including foreign exchange and electronic funds transfers;

Loan Management—Automates loan-manage process, and tracks interest and repayment terms; and

Risk Management—A set of tools to monitor and assess risk, usually using value-at-risk measures.

Academic research to date has tended to focus on highly specialized or niche subjects. A vast literature exists on specific supply chain management subjects such as optimizing inventory policies, network design, routing schemes, and resource allocation. There has been an accelerating trend towards applying academic research results to the practice of corporate management. Researchers and practitioners, in particular in the Operations Management/Operations Research (OM/OR) community, have developed a framework, under the rubric of SCM, to link these various fields. Historically, they have focused on the operational side of a company's activities. From a theoretical standpoint, integration of different aspects of SCM, even on the operations side, is still in its infancy. This is due mainly to a legacy problem: many well known and widely used results would have to be revised to support integration. Furthermore, the mathematical difficulties involved in integration can be non-trivial.

On the finance side, there is a large body of work focusing on topics such as optimal capital structure, cost of capital, hedging methodologies, tax minimization strategies, and depreciation methods. Theoretical linkages between SCM and other fields, such as accounting, corporate finance, international tax law, etc, are not well-established in the academic literature. Some linkages have been proposed, primarily by practitioners, but in a fragmented fashion. Some of the relevant literature that tries to bridge this gap is described below.

Current SCM practice is described in Sridhar Tayur, Ram Ganeshan and Michael J. Magazine, "Quantitative Models for Supply Chain Management (International Series in Operations Research & Management Science, 17)" (December 1998, Kluwer Academic Publishers). This book is a collection of papers by leading authorities in the field of supply chain management, each covering one aspect of SCM, and providing extensive references.

Most models in the current literature use MIP (Mixed Integration Program) models for supply chain design. The optimization objective is typically to minimize costs, although some seek to maximize profit. The general modeling approach—and the concomitant obstacles to incorporating foreign exchange risk—are summarized in the following excerpt from a paper by Morris Cohen and Arnd Huchzermeier:

"The current state-of-the-art in global manufacturing strategy planning models can be characterized by two fundamental approaches: network flow models and option valuation models. Network flow models exploit primarily portfolio effects within the firm's global supply chain network. In general, network structure decisions are numerous, but

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are exercised rather infrequently, e.g., on a periodic base. Alternatively, option value models focus primarily on production switching or sourcing decisions contingent on future states of nature. In general, production options are limited, but can be exercised frequently, e.g. on a continuous basis. The polarization in research is due to the analytical complexities of each modeling approach, i.e. network complexity in the first case and stochastic complexity in the second case. Consequently, there persists a significant gap in the literature on unified modeling approaches for global manufacturing strategy options under exchange risk."

See Morris Cohen and Arnd Huchzermeier, "Global Supply Chain Management: a Survey of Research and Applications", *Quantitative Models for Supply Chain Management* (Ed. S. Tayur, R. Ganeshan, M. Magazine; Kluwer Academic Press 1999) pp. 669–702.

Several authors have proposed simple models linking SCM to FM. Single-period, deterministic models have been developed by James E. Hodder, "Plant Location Modeling for the Multinational Firm", *Proceedings of the Academy of International Business Conference on the Asia-Pacific Dimension of International Business*, Honolulu, 1982, M. A. Cohen, M. L. Fisher and R. Jaikumar, "International Manufacturing and Distribution Networks: A Normative Model Framework," *Managing International Manufacturing* (Ed. Kasra Ferdows: North-Holland, Amsterdam: 1989), and M. A. Cohen and H. L. Lee, "Resource Deployment Analysis of Global Manufacturing and Distribution Networks," *Journal of Manufacturing and Operations Management*, Vol. 2, pp. 81–104, 1989. Hodder developed a mixed-integer programming formulation that combines decisions for plant location, resource allocation, and local borrowing. Cohen, Fisher and Jaikumar propose a hierarchical solution procedure for a nonlinear, mixed-integer programming formulations that defines optimal transfer prices as well as resource allocation, production and sourcing decisions.

For a variety of exchange rate scenarios, Cohen and Lee exploit the potential of a firm's flexible manufacturing and distribution network to balance the firm's global after-tax profit. All of these formulations do not explicitly allow for randomness and dependencies in the cash flows between locations. Doing this ultimately leads to portfolio effects, which can have a significant impact on a firm's choice of global manufacturing strategy.

James E. Hodder, "Financial Market Approaches to Facility Location under Uncertainty," *Operations Research*, Vol. 32, pp. 1374–1380 (1984), James E. Hodder and James V. Jucker, "A simple Plant-Location Model for Quantity-Setting Firms Subject to Price Uncertainty," *European Journal of Operational Research*, Amsterdam, Vol. 21, pp. 39–46 (1985), James E. Hodder and James V. Jucker, "International Plant Location Under Price and Exchange Rate Uncertainty," *International Journal of Production Economics*, Vol. 9, pp. 225–229 (1985) and James E. Hodder and C. Dincer, "A Multifactor Model for International Plant Location and Financing under Uncertainty," *Computers and Operations Research*, Vol. 13, No. 5, pp. 601–609 (1986) adopted a mean-variance objective function. Their proposed problem formulations are based on a multi-factor model for exchange rate determination. However, multi-factor models have performed rather poorly over the period of floating exchange rates.

The model presented in Morris Cohen and Arnd Huchzermeier seeks to maximize the profits of an international company, considering both exchange rate risk and demand uncertainty. They employ a generic model, where uncertainty is captured by expected values.

values are stored. FIG. **12** gives an example of an attribute agent with specialty "ODBC", FIG. **13** a content agent with specialty "ODBC" and FIG. **14** an attribute agent with specialty "WEB". The fields provided below specialty are shown in function of the selected type and specialty.

VISUALIZATION LAYER

The visualization layer **230** comprising knowledge from which a predetermined presentation of an entity is selected and produced. A view is here defined as what a group of users is allowed to see; it is represented as a set of templates attached to classes. It should be noted that some classes can have no template for a given view, meaning that the user has no access to the data requested or that there is a view to be inherited from one classes from which the dependent class depends, or that a default view has been assigned.

A class view data type **233** provides a determination of a single template given a view and a class, or a single view given a template and a class or a list of classes given a template and a view. This data type comprises the fields:

233-1 Class View: identifier, e.g. a serial number, for a class view
223-2 Class: identifier of the Class 225-1 to which the class view is dedicated
223-3 View: identifier of the View 239-1 to which the class view is dedicated
223-4 Template: identifier of the Template 235-1 to which the class view is dedicated

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To each class view, one or more class view mappings can be dedicated. The class view mappings data type **231** holds variable substitution data. When a template is processed, for example as HTML or VRML generation, "value holders" such as "%supplier" are substituted by their values. A value holder can refer by name either to a class defined attribute, a class view mapping variable or a template variable. An attribute has precedence over a class view mapping variable which has precedence over a template variable. In other words, the value of a value holder in a template will default to the value of a template variable only as a last resort. The class view mappings data type **231** comprises the fields:

231-1 Class view: identifier of the Class View 223-1 to which the class view mapping is dedicated.
231-2 Name: the name of the variable, for example supplier.
231-3 Expansion: a value of a variable, in particular a template.

Class views are dedicated to views. The view data type **239** comprises the definition of a view. A view represents what a group of users is allowed to see. A view is a set of templates assigned to classes. Each template is retrievable from the class view table, given the view and a class. The view data type comprises the fields:

239-1 View: a unique identifier for the view.
239-2 Name: the name of the view, for example "Inventory managers"
239-3 Description: provided for holding annotations
239-4 Links: the text of a default link template for the view, which is used when no template of the type link (see 235-3) has been dedicated to a view.
239-5 Generic template: identifier of a default template 237-1 used when more than one empty is found; although the user has requested for one entity, for example one book; this can occur when there is a "conflict of opinion" as will be explained further.

-continued

239-6 Authentication: indicates the name of a user's group if the present view is restricted to particular users. A password could be requested for some particular views. This password protection of views is performed with techniques known as such.

Each class view is dedicated to a template. The templates data type **235** comprises data related for producing a presentation of an instance of a class, for example HTML, XML or VRML presentations. This data type comprises the fields:

235-1 Template: a unique identifier for a template
235-2 Name: text indicating the name of the template
235-3 Type: indicates the type of the template, for example an object template (in particular an item), a space template (in particular a page), a link template (for representing a value of an attribute, in particular a hyperlink), . . .
235-4 Specialty: determines the presentation medium, for example HTML, VRML, XML, etc.
235-5 Description: enables the manager of the system to add comments and annotations
235-6 Content: gives the actual test of the template, this embedded value holders
235-7 Extent: indicates spatial dimensions for three dimensional object or spaces for VRML presentations

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Each template may comprise a number of template attributes. The template attributes data type **237** comprises template variables used in value substitution, as explained with reference to the class view mappings data type **231**. The template attributes data type **237** comprises the fields:

237-1 Template: identifier of the template 235-1 to which the template attributes is dedicated
237-2 Name: identifies the name of the variable.
237-3 Default value: if applicable, a default value of that variable

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DATA LAYER

In order to improve response time, instances or entities retrieved by an embodiment are preferably cached. The content and attributes of instances are stored separately. This enables to cache for example the attributes of an instance and not its contents or vice versa. An instance is cached no longer than is permitted by its class's life span **235-4**.

The instance data type **215** is provided for holding the instances or entities cached by the system according to the present invention. This data type comprises the fields:

215-1 Instance: identifier of an instance
215-2 Class, identifier of the class 225-1 to which the entity or instance pertains
215-3 Expiration: indicates the moment when a cached instance expires. This moment is calculated on the moment the data is retrieved plus the life span indicated in the life span field 225 -4
215-4 Agent state: is a list of agent identifiers 227-1 that were used for retrieving the cached content or attributes of an instance.

The contents data type **213** comprises the content, retrieved by means of a content agent, of cached instances. A content is a list of references to instances of a given class. The content data type **213** comprises the fields:

years no longer occupies the mainstream of the research in price determination. Now the field for valuation methods is wide-open for non-traditional ideas. However, the valuation system used in this invention still belongs to the long line of the historical mainstream traditional approach based on fundamental thoughts in economics. Most non-traditional methods for the practical purpose of producing a value for the price are based on the calculation of the return on investment. They suffer mainly from two defects: (1) the calculations, especially for intellectual properties, are not taken to infinity in time and (2) the rate of return, from the deterministic solution to price, should be a market invariant, a constant, which once found should stay approximately the same for a particular type of investment, and should not be the quantity to be calculated once it is known; the price a market variant, should be calculated based on the rate of return. In this regard, it should be noted that the actual rate of return is generally different from the expected rate of return, which is an approximate time-invariant variables and is the rate of return generally used in the deterministic method of valuation.

To summarize the background information for this invention, the following listing of valuation concepts have been categorized into seven groups, the first six of which relate to the current methods, and the last of which describes this invention. The defects of the first six groups are stated immediately under the group title, which is represented by a most popular representative and a general description for the group. No detailed description of the items are given because the listing is intended to be a way to summarily refuting the uncountable number of methods claiming to be solutions or partial solutions to price determination. The list is by no means exhaustive, but the most popular current valuation methods should fall within one of the first six groups.

I. Supply and Demand Model (Spatial Oriented Approaches—Present)
(Defect: The temporal consideration is inadequate.)
Arrow-Debrue Theory
Assets
Capital
Ceteris Paribus
Competitive Pricing
Control Theory
Covariance
Efficient Market Theory
Efficient Set
Empirical General Equation Model
Expected Return
Financial Statement
Fixed Point Theory
Game Theory
General Economic Equilibrium Analysis
Graphical Method
Gross Revenue or Income
Income Statement
Indifference Curve
Inventories
Law of Supply and Demand
Leontief Model
Liabilities
Linear Programming
Marginal Usefulness
Market
Marshalliam Model
Mathematical Economics
Microeconomics

Monopolistic Pricing
Neoclassical G.E. Model
Net Revenue or Income
Net Worth
Phillips Curve
Price/Earning Ratio
Production Function
Profit
Set Theory
Simplex Method
Social Accounting Matrix Model
Standard Deviation
Swap
Utility Function
von Neumann-Morgenstern Theorem
II. Income Approach (Temporal Oriented Approach—Future)
Defect: The average rates of return for different years are generally different. Therefore, different discount rates should be used generally for each and every year.)
Accounting
Annuities
Arbitrage Pricing Theory (APT)
Business Appraisal
Capital Allocation Theory
Capital Asset Pricing Model (CAPM)
Capitalization Method
Causal Forecasting Model
Continuing-Value Formula
Corner Portfolios
Debt-Free Valuation Method
Depreciation
Discounted Cash Flow Method
Dividend Discount Models (DDMs)
Earning Approach
Economic Value
Finance
Forecasting
Free Cash Flow Perpetuity Formula
Holding Period
Income Approach
Interest
Investment Horizon
Investment Value
Internal Rate of Return
Modern Portfolio Theory
Multiple Regression Analysis
Optimal Resource Allocation Over Time
Perpetuity Calculation
Portfolio Theory
Present Value
Profit Maximization Model
Rate of Return Calculation
Rational Expectation Model
Regression Model
Rental Rate
Reversion
Spreadsheet
Taxation
Terminal Value
Theory of Investment
Time Cost of Money
Time Series Analysis
Uncertainty
Value-Driver Formula
III. Market Comparison Approach and Time Series Analysis (Empirical Methods—Past)